

SEQUENCE LISTING

<110> Pioneer Hi-Bred International, Inc.

<120> Proteins With Enhanced Levels of
Essential Amino Acids

<130> 0571R2

<150> 08/740,682

<151> 1996-11-01

<150> PCT/US97/20441

<151> 1997-10-31

<160> 32

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 249

<212> DNA

<213> Hordeum vulgare

<220>

<221> CDS

<222> (1)...(249)

<400> 1

agt tca gtg gag aag aag ccg gag gga gtg aac acc ggt gct ggt gac	48
Ser Ser Val Glu Lys Lys Pro Glu Gly Val Asn Thr Gly Ala Gly Asp	
1 5 10 15	

cgt cac aac ctg aag aca gag tgg cca gag ttg gtg ggg aaa tcg gtg	96
Arg His Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val	
20 25 30	

gag gag gcc aag aag gtg att ctg cag gac aag cca gag gcg caa atc	144
Glu Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile	
35 40 45	

ata gtt cta ccg gtg ggg aca att gtg acc atg gaa tat cgg atc gac	192
Ile Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp	
50 55 60	

cgc gtc cgc ctc ttt gtc gat aaa ctc gac aac att gcc cag gtc ccc	240
Arg Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro	
65 70 75 80	

agg gtc ggc	249
Arg Val Gly	

<210> 2

<211> 83

<212> PRT

<213> Hordeum vulgare

<400> 2

Ser Ser Val Glu Lys Lys Pro Glu Gly Val Asn Thr Gly Ala Gly Asp
 1 5 10 15
 Arg His Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val
 20 25 30
 Glu Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile
 35 40 45
 Ile Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp
 50 55 60
 Arg Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro
 65 70 75 80
 Arg Val Gly

<210> 3
 <211> 198
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)...(198)

<400> 3
 atg aac ctg aag aca gag tgg cca gag ttg gtg ggg aaa tcg gtg gag 48
 Met Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 gag gcc aag aag gtg att ctg cag gac aag cca gag gcg caa atc ata 96
 Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 gtt cta ccg gtg ggg aca att gtg acc atg gaa tat cgg atc gac cgc 144
 Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp Arg
 35 40 45
 gtc cgc ctc ttt gtc gat aaa ctc gac aac att gcc cag gtc ccc agg 192
 Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 gtc ggc 198
 Val Gly
 65

<210> 4
 <211> 66
 <212> PRT
 <213> Hordeum vulgare

<400> 4
 Met Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp Arg
 35 40 45
 Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 Val Gly
 65

<210> 5

<211> 198
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)...(198)

<400> 5
 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag 48
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata 96
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 gtt ctg ccg gtt ggt aca aag gtg acg aag gaa tat aag atc gac cgc 144
 Val Leu Pro Val Gly Thr Lys Val Thr Lys Glu Tyr Lys Ile Asp Arg
 35 40 45
 gtc aag ctc ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg 192
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 gtc ggc 198
 Val Gly
 65

<210> 6
 <211> 66
 <212> PRT
 <213> Hordeum vulgare

<400> 6
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 Val Leu Pro Val Gly Thr Lys Val Thr Lys Glu Tyr Lys Ile Asp Arg
 35 40 45
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 Val Gly
 65

<210> 7
 <211> 198
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)...(198)

<400> 7
 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag 48
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata 96

Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 gtt cta ccg gtt ggt aca aag gtg gcg aag gcc tat aag atc gac aag 144
 Val Leu Pro Val Gly Thr Lys Val Ala Lys Ala Tyr Lys Ile Asp Lys
 35 40 45
 gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg 192
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 gtc ggc 198
 Val Gly
 65

<210> 8
 <211> 66
 <212> PRT
 <213> Hordeum vulgare

<400> 8
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 Val Leu Pro Val Gly Thr Lys Val Ala Lys Ala Tyr Lys Ile Asp Lys
 35 40 45
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 Val Gly
 65

<210> 9
 <211> 198
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1) ... (198)

<400> 9
 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag 48
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata 96
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 gtt cta ccg gtt ggt aca aag gtg ggt aag cat tat aag atc gac aag 144
 Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile Asp Lys
 35 40 45
 gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg 192
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 gtc ggc 198
 Val Gly
 65

<210> 10
 <211> 66
 <212> PRT
 <213> Hordeum vulgare

<400> 10
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile Asp Lys
 35 40 45
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 Val Gly
 65

<210> 11
 <211> 252
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)...(252)

<400> 11
 atg aag tcg gtg gag aag aaa ccg aag ggt gtg aag aca ggt gcg ggt 48
 Met Lys Ser Val Glu Lys Lys Pro Lys Gly Val Lys Thr Gly Ala Gly
 1 5 10 15
 gac aag cat aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg 96
 Asp Lys His Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser
 20 25 30
 gtg gag aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa 144
 Val Glu Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln
 35 40 45
 atc ata gtt cta ccg gtt ggt aca aag gtg ggt aag cat tat aag atc 192
 Ile Ile Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile
 50 55 60
 gac aag gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc 240
 Asp Lys Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val
 65 70 75 80
 ccc agg gtc ggc 252
 Pro Arg Val Gly

<210> 12
 <211> 84
 <212> PRT
 <213> Hordeum vulgare

<400> 12
 Met Lys Ser Val Glu Lys Lys Pro Lys Gly Val Lys Thr Gly Ala Gly
 1 5 10 15

Asp Lys His Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser
 20 25 30
 Val Glu Lys Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln
 35 40 45
 Ile Ile Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile
 50 55 60
 Asp Lys Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val
 65 70 75 80
 Pro Arg Val Gly

<210> 13
 <211> 198
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)...(198)

<400> 13
 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag 48
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata 96
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 gtt cta ccg gtt ggt aca aag gtg acg ggc gaa tac aag atc gac cgc 144
 Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Tyr Lys Ile Asp Arg
 35 40 45
 gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg 192
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 gtc ggc 198
 Val Gly
 65

<210> 14
 <211> 66
 <212> PRT
 <213> Hordeum vulgare

<400> 14
 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
 1 5 10 15
 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
 20 25 30
 Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Tyr Lys Ile Asp Arg
 35 40 45
 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
 50 55 60
 Val Gly
 65

<210> 15
 <211> 201
 <212> DNA

<213> Hordeum vulgare

<220>

<221> CDS

<222> (1)...(201)

<400> 15

atg	gct	aag	atg	aag	aca	acg	tgg	cct	gag	ctg	gtg	ggc	aag	acc	gtg	48
Met	Ala	Lys	Met	Lys	Thr	Thr	Trp	Pro	Glu	Leu	Val	Gly	Lys	Thr	Val	
1				5					10					15		

gag	aaa	gcc	aag	aag	atg	atc	atg	aag	gac	aag	cca	gag	gcg	aag	atc	96
Glu	Lys	Ala	Lys	Lys	Met	Ile	Met	Lys	Asp	Lys	Pro	Glu	Ala	Lys	Ile	
			20					25					30			

atg	gtt	ctg	cca	gtt	ggg	acc	aaa	gtg	acc	ggt	gaa	tgg	aag	atg	gat	144
Met	Val	Leu	Pro	Val	Gly	Thr	Lys	Val	Thr	Gly	Glu	Trp	Lys	Met	Asp	
		35					40					45				

cgc	gtc	aaa	ctc	tgg	gtc	gac	aag	aag	gac	aag	atc	gcc	aag	act	ccg	192
Arg	Val	Lys	Leu	Trp	Val	Asp	Lys	Lys	Asp	Lys	Ile	Ala	Lys	Thr	Pro	
	50					55					60					

aag	gtc	ggc														201
Lys	Val	Gly														
65																

<210> 16

<211> 67

<212> PRT

<213> Hordeum vulgare

<400> 16

Met	Ala	Lys	Met	Lys	Thr	Thr	Trp	Pro	Glu	Leu	Val	Gly	Lys	Thr	Val	
1				5					10					15		
Glu	Lys	Ala	Lys	Lys	Met	Ile	Met	Lys	Asp	Lys	Pro	Glu	Ala	Lys	Ile	
			20					25					30			
Met	Val	Leu	Pro	Val	Gly	Thr	Lys	Val	Thr	Gly	Glu	Trp	Lys	Met	Asp	
		35					40					45				
Arg	Val	Lys	Leu	Trp	Val	Asp	Lys	Lys	Asp	Lys	Ile	Ala	Lys	Thr	Pro	
	50					55					60					
Lys	Val	Gly														
65																

<210> 17

<211> 201

<212> DNA

<213> Hordeum vulgare

<220>

<221> CDS

<222> (1)...(201)

<400> 17

atg	gct	aag	atg	aag	aca	acg	tgg	cct	gag	ctg	gtg	ggc	aag	acc	gtg	48
Met	Ala	Lys	Met	Lys	Thr	Thr	Trp	Pro	Glu	Leu	Val	Gly	Lys	Thr	Val	
1				5					10					15		

gag	aaa	gcc	aag	aag	atg	atc	atg	aag	gac	aag	cca	gag	gcg	aag	atc	96
Glu	Lys	Ala	Lys	Lys	Met	Ile	Met	Lys	Asp	Lys	Pro	Glu	Ala	Lys	Ile	
			20					25					30			

atg gtt ctg cca gtt ggg acc aaa gtg acc ggt gaa tgg aag atg gat 144
 Met Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Trp Lys Met Asp
 35 40 45

cgc gtc cgc ctc tgg gtc gac aag aag gac aag atc gcc aag act ccg 192
 Arg Val Arg Leu Trp Val Asp Lys Lys Asp Lys Ile Ala Lys Thr Pro
 50 55 60

aag gtc ggc 201
 Lys Val Gly
 65

<210> 18
 <211> 67
 <212> PRT
 <213> Hordeum vulgare

<400> 18
 Met Ala Lys Met Lys Thr Thr Trp Pro Glu Leu Val Gly Lys Thr Val
 1 5 10 15
 Glu Lys Ala Lys Lys Met Ile Met Lys Asp Lys Pro Glu Ala Lys Ile
 20 25 30
 Met Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Trp Lys Met Asp
 35 40 45
 Arg Val Arg Leu Trp Val Asp Lys Lys Asp Lys Ile Ala Lys Thr Pro
 50 55 60
 Lys Val Gly
 65

<210> 19
 <211> 201
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1) ... (201)

<400> 19
 atg gct aag atg aag tgc acg tgg cct gag ctg gtg ggc aag acc gtg 48
 Met Ala Lys Met Lys Cys Thr Trp Pro Glu Leu Val Gly Lys Thr Val
 1 5 10 15

gag aaa gcc aag aag atg atc atg aag gac aag cca gag gcg aag atc 96
 Glu Lys Ala Lys Lys Met Ile Met Lys Asp Lys Pro Glu Ala Lys Ile
 20 25 30

atg gtt ctg cca gtt ggg acc aaa gtg acc ggt gaa tgg aag atg gat 144
 Met Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Trp Lys Met Asp
 35 40 45

cgc gtc cgc ctc tgg gtc gac aag aag gac aag atc gcc aag act ccg 192
 Arg Val Arg Leu Trp Val Asp Lys Lys Asp Lys Ile Ala Lys Thr Pro
 50 55 60

aag tgc ggc 201
 Lys Cys Gly
 65

<210> 20
 <211> 67
 <212> PRT
 <213> Hordeum vulgare

<400> 20
 Met Ala Lys Met Lys Cys Thr Trp Pro Glu Leu Val Gly Lys Thr Val
 1 5 10 15
 Glu Lys Ala Lys Lys Met Ile Met Lys Asp Lys Pro Glu Ala Lys Ile
 20 25 30
 Met Val Leu Pro Val Gly Thr Lys Val Thr Gly Glu Trp Lys Met Asp
 35 40 45
 Arg Val Arg Leu Trp Val Asp Lys Lys Asp Lys Ile Ala Lys Thr Pro
 50 55 60
 Lys Cys Gly
 65

<210> 21
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Primer based on Hordeum vulgare

<400> 21
 atgaagtcgg tggagaag

18

<210> 22
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer based on Hordeum vulgare

<400> 22
 gccgaccctg gggacctg

18

<210> 23
 <211> 459
 <212> DNA
 <213> Zea mays

<220>
 <221> CDS
 <222> (1)...(288)

<221> misc_feature
 <222> (1)...(459)
 <223> n = A,T,C or G

<400> 23
 gca gtg caa caa gca aga ttt acc tgc cca tcg atc ata tcg tca act
 Ala Val Gln Gln Ala Arg Phe Thr Cys Pro Ser Ile Ile Ser Ser Thr
 1 5 10 15

48

ggt ccg gca gtt cgc gac acc atg agc tcc acg gag tgc ggc ggc ggc
 Gly Pro Ala Val Arg Asp Thr Met Ser Ser Thr Glu Cys Gly Gly Gly
 20 25 30

96

ggc ggc ggc gcc aag acg tcg tgg cct gag gtg gtc ggg ctg agc gtg 144
 Gly Gly Gly Ala Lys Thr Ser Trp Pro Glu Val Val Gly Leu Ser Val
 35 40 45

gag gac gcc aag aag gtg atg gtc aag gac aag ccg gac gcc gac atc 192
 Glu Asp Ala Lys Lys Val Met Val Lys Asp Lys Pro Asp Ala Asp Ile
 50 55 60

gtg gtg ctg ccc gtc ggc tcc gtg gtg acc gcg gat tat cgc cct aac 240
 Val Val Leu Pro Val Gly Ser Val Val Thr Ala Asp Tyr Arg Pro Asn
 65 70 75 80

cgt gtc cgc atc ttc gtc gac atc gtc gcc cag acg ccc cac atc ggc 288
 Arg Val Arg Ile Phe Val Asp Ile Val Ala Gln Thr Pro His Ile Gly
 85 90 95

tgataatata taagctagcc gctatttccct ttccttgccc cagaacttga aataaatata 348
 tatacgatga aataacgcgg gcatgccgaa tanatggant gtgnntgaat tctcactaat 408
 taagtaatgn cataaataaa cgtattcaaa aaaaaaaaaa aaaaaaaaaa a 459

<210> 24

<211> 96

<212> PRT

<213> Zea mays

<220>

<221> VARIANT

<222> (1)...(146)

<223> Xaa = Any Amino Acid

<400> 24

Ala Val Gln Gln Ala Arg Phe Thr Cys Pro Ser Ile Ile Ser Ser Thr
 1 5 10 15
 Gly Pro Ala Val Arg Asp Thr Met Ser Ser Thr Glu Cys Gly Gly Gly
 20 25 30
 Gly Gly Gly Ala Lys Thr Ser Trp Pro Glu Val Val Gly Leu Ser Val
 35 40 45
 Glu Asp Ala Lys Lys Val Met Val Lys Asp Lys Pro Asp Ala Asp Ile
 50 55 60
 Val Val Leu Pro Val Gly Ser Val Val Thr Ala Asp Tyr Arg Pro Asn
 65 70 75 80
 Arg Val Arg Ile Phe Val Asp Ile Val Ala Gln Thr Pro His Ile Gly
 85 90 95

<210> 25

<211> 428

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (1)...(303)

<400> 25

cga ccc acg cgt ccg ccc acg cgt ccg gca aga ttt acc tgc cca tcg 48
 Arg Pro Thr Arg Pro Pro Thr Arg Pro Ala Arg Phe Thr Cys Pro Ser
 1 5 10 15

atc ata tcg tca act ggt ccg gca gtt cgc gac acc atg agc tcc acg 96
 Ile Ile Ser Ser Thr Gly Pro Ala Val Arg Asp Thr Met Ser Ser Thr
 20 25 30

<400> 27
tta att att gcc ctt tca gtt ngc cat cgg cag ccg agc acc atg agc 48
Leu Ile Ile Ala Leu Ser Val Xaa His Arg Gln Pro Ser Thr Met Ser
1 5 10 15

tcc aca ggc ggc ggc gac gat ggc gcc aag aag tct tgg ccg gaa gtg	96
Ser Thr Gly Gly Gly Asp Asp Gly Ala Lys Lys Ser Trp Pro Glu Val	
20 25 30	
gtc ggg ctc agc ctg gaa gaa gcc aag agg gtg atc ctg tgc gac aag	144
Val Gly Leu Ser Leu Glu Glu Ala Lys Arg Val Ile Leu Cys Asp Lys	
35 40 45	
ccc gac gcc gac atc gtc gtg ctg ccc gtc ggc acg ccg gtg acc atg	192
Pro Asp Ala Asp Ile Val Val Leu Pro Val Gly Thr Pro Val Thr Met	
50 55 60	
gat ttc cgc ccc aac cgc gtc cgc atc ttc gtc gac acc gtc gcg gag	240
Asp Phe Arg Pro Asn Arg Val Arg Ile Phe Val Asp Thr Val Ala Glu	
65 70 75 80	
gca mcc cac atc ggc tgagggttaaa tctacaaaat gaatgaytcg gacatgccat	295
Ala Xaa His Ile Gly	
85	
gcgtacntgt ccgtcgccga ataatggatg tgtgtgtgct tcgacgttc ctaataagtt	355
gctagtnaaa aataatnggc atcgctgta ntgcataaat aaaaagtatc agaataatgt	415
tcaccctttc naaaaaaaaa aaaaaa	441

<210> 28

<211> 85

<212> PRT

<213> Zea mays

<220>

<221> VARIANT

<222> (1)...(85)

<223> Xaa = Any Amino Acid

<400> 28

Leu Ile Ile Ala Leu Ser Val Xaa His Arg Gln Pro Ser Thr Met Ser	
1 5 10 15	
Ser Thr Gly Gly Asp Asp Gly Ala Lys Lys Ser Trp Pro Glu Val	
20 25 30	
Val Gly Leu Ser Leu Glu Glu Ala Lys Arg Val Ile Leu Cys Asp Lys	
35 40 45	
Pro Asp Ala Asp Ile Val Val Leu Pro Val Gly Thr Pro Val Thr Met	
50 55 60	
Asp Phe Arg Pro Asn Arg Val Arg Ile Phe Val Asp Thr Val Ala Glu	
65 70 75 80	
Ala Xaa His Ile Gly	
85	

<210> 29

<211> 382

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (1)...(213)

<221> misc_feature

<222> (1)...(382)

<223> n = A,T,C or G

<400> 29

gtg cgt cgt cgg cga aca gcc acc ggc ggc aag acg tcg tgg ccg gag 48
 Val Arg Arg Arg Arg Thr Ala Thr Gly Gly Lys Thr Ser Trp Pro Glu
 1 5 10 15

gtg gtc ggg ctg agc gtc gag gaa gcc aag aag gtg att ctg gcg gac 96
 Val Val Gly Leu Ser Val Glu Glu Ala Lys Lys Val Ile Leu Ala Asp
 20 25 30

aag ccg aac gcc gac atc gtg gtg ctg ccc acc acc acg cag gcg gtg 144
 Lys Pro Asn Ala Asp Ile Val Val Leu Pro Thr Thr Thr Gln Ala Val
 35 40 45

acc tcc gac ttt ggg ttc gac cgt gtc cgc gtc ttc gtc ggg acc gtc 192
 Thr Ser Asp Phe Gly Phe Asp Arg Val Arg Val Phe Val Gly Thr Val
 50 55 60

gcc cag acg ccc cat gtt ggc taggctagag cctcagccta gaggtcgtcg 243
 Ala Gln Thr Pro His Val Gly
 65 70

gcaccgccgg ccattgaccac ctgctantat gtcactnact agtaataaag tatwaataac 303
 agggaggatg catgctcatc nttggaatct gtacgcttgt tggactacta cttggctact 363
 tgaaaaaaaa aaaaaaaaaa 382

<210> 30

<211> 71

<212> PRT

<213> Zea mays

<400> 30

Val Arg Arg Arg Arg Thr Ala Thr Gly Gly Lys Thr Ser Trp Pro Glu
 1 5 10 15
 Val Val Gly Leu Ser Val Glu Glu Ala Lys Lys Val Ile Leu Ala Asp
 20 25 30
 Lys Pro Asn Ala Asp Ile Val Val Leu Pro Thr Thr Thr Gln Ala Val
 35 40 45
 Thr Ser Asp Phe Gly Phe Asp Arg Val Arg Val Phe Val Gly Thr Val
 50 55 60
 Ala Gln Thr Pro His Val Gly
 65 70

<210> 31

<211> 448

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (1)...(240)

<221> misc_feature

<222> (1)...(448)

<223> n = A,T,C or G

<400> 31

cga ttt agc tat agc agg tct cga tcg gcg gcc atg agc ggt agc cgc 48
 Arg Phe Ser Tyr Ser Arg Ser Arg Ser Ala Ala Met Ser Gly Ser Arg
 1 5 10 15

agc aag aag tcg tgg ccg gag gtg gag ggg ctg ccg tcc gag gtg gcc 96
 Ser Lys Lys Ser Trp Pro Glu Val Glu Gly Leu Pro Ser Glu Val Ala
 20 25 30

aag cag aaa att ctg gcc gac cgc ccg gac gtc cag gtg gtc gtt ctg 144
Lys Gln Lys Ile Leu Ala Asp Arg Pro Asp Val Gln Val Val Val Leu
35 40 45

ccc gac ggc tcc ttc gtc acc act gat ttc aac gac aag cgc gtc cgg 192
Pro Asp Gly Ser Phe Val Thr Thr Asp Phe Asn Asp Lys Arg Val Arg
50 55 60

gtc ttc gtc gac aac gcc gac aac gtc gcc aaa gtc ccc aag atc ggc 240
Val Phe Val Asp Asn Ala Asp Asn Val Ala Lys Val Pro Lys Ile Gly
65 70 75 80

tagctagcta	gctaggccca	atcggttctaa	tcagctagtt	tctttctttc	ataaataaaaa	300
gtcctctctc	gtaccgggac	tgtgatgttt	cctagttgt	ctcgtagctg	ttgttttctg	360
tcttaatgga	tgccatggcg	ccgcgcgcgc	cctycatcat	gaaaagctac	atttgaaacg	420
attttnagta	ttctttgctg	ttaaaaaa				448

<210> 32

<211> 80

<212> PRT

<213> Zea mays

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	50					55				60					
Val	Phe	Val	Asp	Asn	Ala	Asp	Asn	Val	Ala	Lys	Val	Pro	Lys	Ile	Gly
65				70					75					80	